

**BioChain Institute Inc.**



# Instruction Manual

Automated Nucleic Acid Preparation System

## AnaPrep 12



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Manual No. Z1001

Version: Z1321001UA (MV1.14)

For General Laboratory Use Only



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# INTRODUCTION

Thank you for purchase of the AnaPrep 12 system which is a fully automated, stand-alone instrument that can purify nucleic acids within 30-45 minutes. With advanced magnetic bead separation technology, it provides high quality extraction results. Moreover, this easy to use interface frees users from troublesome settings and maintenance.

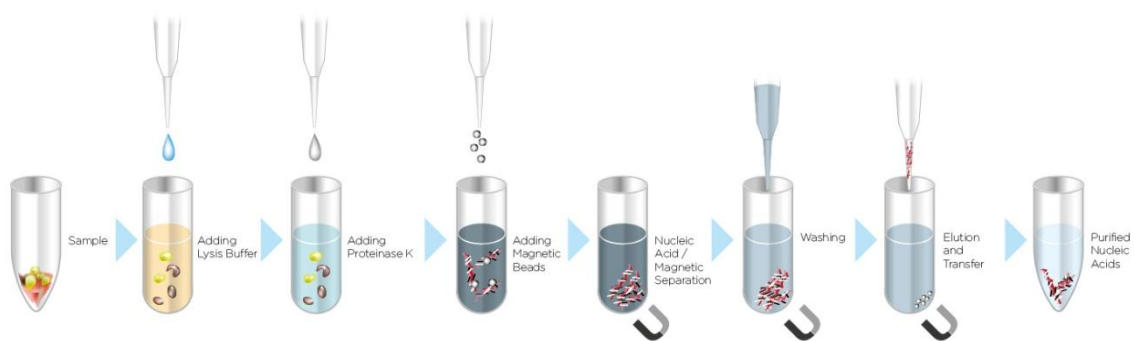
This guide contains important information regarding the safe use of the AnaPrep 12 system. Please read this manual carefully before operating the system for the first time, especially the Safety Information.

If there is any question about how to install or operate it, please contact our certified distributors / agents or email to our technical support center ( techsupport@biochain.com ).

## Contact Info:

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Tel:	1-510-783-8588
Fax:	1-510-783-5386
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## AnaPrep Magnetic Bead Preparation Process



# SAFFETY INFORMATION

The meanings of safety precaution marks are as follows:

## **WARNING:**

“WARNING” indicates a dangerous condition that may lead to death or serious injury.



## **BIOHAZARD:**

This symbol is used to indicate that certain precautions must be taken when working with potentially infectious material.



## **CAUTION:**

This symbol is used to indicate that non-compliance with instructions or procedures may lead to physical injury or even death or could cause damage to the instrument.

## **Important:**

“Important” shows the important notes for usage, as well as prohibited actions.

## **Note:**

“Note” indicates the notes, procedures that should be obeyed and supplementary information for use.



## **HOT SURFACE:**

This symbol is used to label potentially hot instrument surfaces.

For your safety and that of others, follow the guidelines provided in the following pages concerning the use of the AnaPrep 12 system.

## **About Instrument**

### **WARNING:**

- Ignoring the following notations may lead to fire or electric shock.
  - In countries other than Taiwan, US and Canada, use a power cable that meets your country's standard, or contact your local distributor.
  - Do not use the AnaPrep 12 system with voltage other than the voltage specified on the device.
  - Do not use the AnaPrep 12 system with a damaged power plug or a loose socket.
  - If there is dust on the prongs of the power plug or on the plug socket, remove it with a dry cloth.
  - When you disconnect the plug from the outlet, be sure to hold the power plug itself. Do not pull the power cable.
  - For maintenance, disconnect the power plug from the outlet.
  - Do not touch the power plug when you hear the crash of thunder.
- Do not pour any liquid on the AnaPrep 12 system.
- Do not place any objects containing liquid on the AnaPrep 12 system. Doing so may cause a device failure, fire, or electric shock.
- In the event the device overheats, starts to smoke or smells strange, immediately unplug the power cable.



### **CAUTION:**

- Never attempt to reconfigure or disassemble the AnaPrep 12 system without the manufacturer's permission. Doing so may cause fire or electric shock.
- Do not place or drop objects on the AnaPrep 12 system. Also refrain from

bumping or knocking it, as doing so may cause a failure or malfunction of the AnaPrep 12 system.

- If any liquid materials are left inside the device, wipe it up a soft paper tissue, etc. Otherwise, the AnaPrep 12 system may be damaged.
- Repairs to the AnaPrep 12 system should only be performed by personnel specifically authorized by the BioChain Institute Inc.
- Only original BioChain Institute Inc. replacement parts should be used.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

## **About Reagent Kits**



### **CAUTION:**

- When handling any of the kits, refer to the respective handbook.
- Reagents in each kit should be handled by observing the safety information and precautions regarding the kit.
- Extraction should be performed in an appropriate laboratory or workplace.

### **Note:**

The kits are not supplied with the AnaPrep 12 system. Select the desired kit(s) and order it (them) separately.

## **About Samples**



### **BIOHAZARD:**

- Always wear appropriate gloves, a mask, and safety goggles etc. when handling any infectious samples.

## **About Infectious Wastes**

- When handling or disposing of infectious materials, follow the laboratory guidelines or the law regarding infectious waste to perform proper incineration, fusion, sterilization, and/or disinfection.
- If you use a third party to dispose of hazardous waste, be sure to outsource this work to an operator who is licensed to handle medical waste that is subject to special control.

## **BioChain Service Center**

- For technical issues or instrument maintenance please contact our service center:



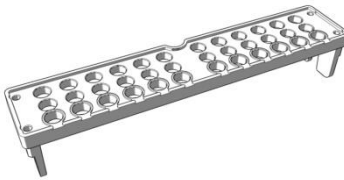
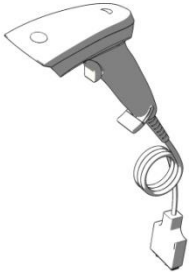
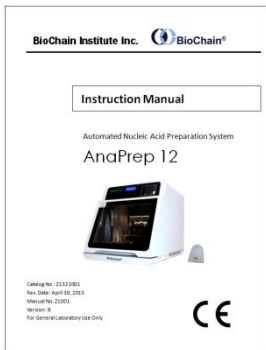
BioChain Institute Inc.  
39600 Eureka Dr.  
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# 1 Installation

## 1.1 Composition of the AnaPrep 12 system

Check that the following are included in the package. Contact your local representative if you notice any missing part(s).

<b>A</b> 	<b>B</b> 
<b>C</b> 	<b>D</b> 
<b>E</b> 	

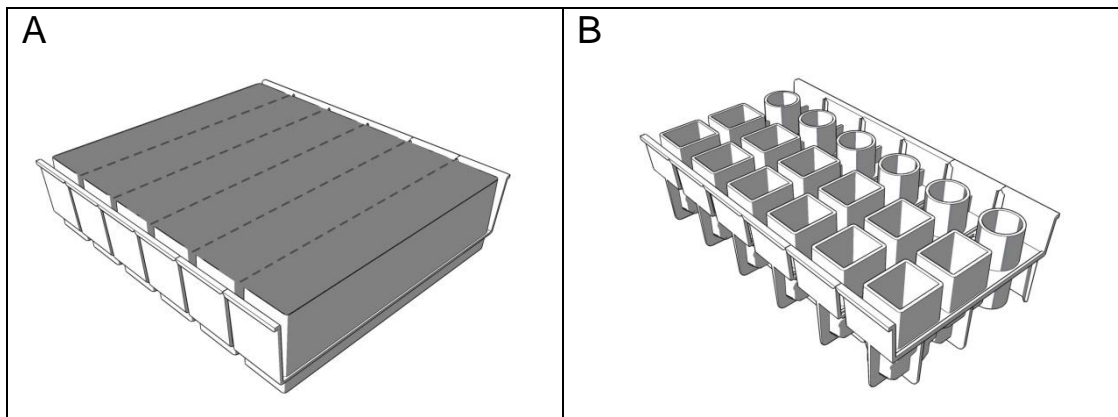
	Qty
A. AnaPrep Instrument	1
B. Power Cord	1
C. Sample Tube Rack	1
D. Barcode Reader	1
E. User's Manual	1

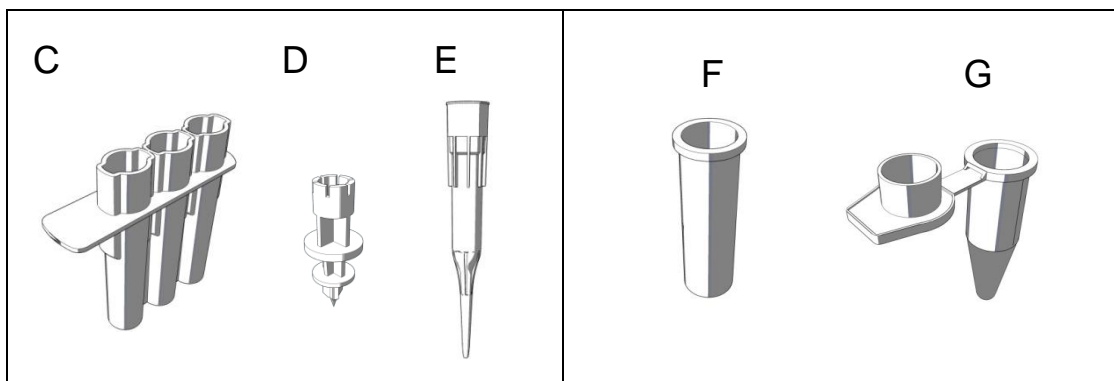
Please make sure all of the components are free from damages as soon as you get the system. If any damage is found, please contact your local representative for immediate support.

**Note:**

BioChain's global warranty does not cover the damages from the transportation or improper operation.

## 1.2 Contents of Reagent Kits





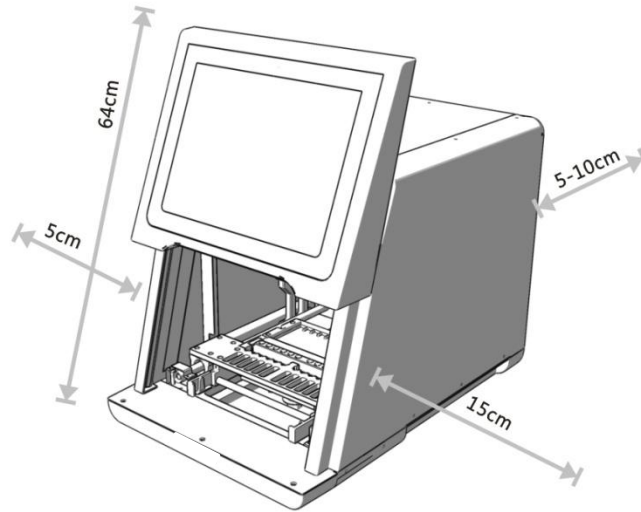
- A. Reagent Cartridge(s)
- B. Reaction Chamber(s)
- C. Tip Holder
- D. Piercing
- E. Filtered tip
- F. Sample tube
- G. Elute tube

**Note:**

- Reagent kits are purchased separately. Please contact your local agents or representatives to get further information.
- The contents of the reagent kits will be varied. Refer to the handbook for kits enclosed in the reagent box for more details.

### 1.3 Operating Environment / Condition

Use the AnaPrep 12 system in a location that meets the following conditions:



- The space allocated for the AnaPrep 12 system must be at least 5-10 cm from the instrument to the side walls.
- A location where power can be provided.
- A location where the temperature is 10 to 40°C and relative humidity is 30 to 80% (non-condensing).
- A location that is flat and stable, with no vibration.
- A location away from direct sunlight (Block the sunlight by closing curtains or blinds if necessary).
- A location which is well-ventilated and not dusty.
- A location where the temperature does not go up or down suddenly. Warming a cold room suddenly or moving the AnaPrep 12 system from a room with low temperature to a warm room may cause condensation inside the device, resulting in abnormal extraction.
- A location where the temperature and humidity are kept within the specified range (far from water taps, water heaters, humidifiers, air-conditioners and heaters).
- A location far from objects which generate strong magnetic fields (motors, transformers, TVs, audio speakers, magnets, etc.). Bringing

the AnaPrep 12 system close to any type of magnetic field may cause malfunction.

**Warning:**

Do not use the AnaPrep 12 system in a location where it is wet or can be splashed with water. Doing so may cause device failure, fire, or electric shock.

When relocating the AnaPrep 12 system, disconnect the plug from the outlet first. If the power cable is damaged, this may cause device failure, fire, injury, or electric shock.



**Caution:**

Do not use the AnaPrep 12 system in an unstable place such as a slanted surface or a place subject to vibrations. It may cause injury or device failure.

Do not use the AnaPrep 12 system in direct sunlight or close to a heating device. It may shorten the life of the AnaPrep 12 system or cause equipment malfunction.

## Operating Conditions

Items		Conditions
Temperature (°C)	During operation	10 – 40
	During down time	0 – 55
Humidity (RH)	During operation	30 – 80
	During down time	10 – 80
Max. wet bulb temperature (°C)	During operation	29 (non condensing)
	During down time	29 (non condensing)

Temperature gradient (°C/hr)	12 or less (non condensing)
Humidity gradient (RH/day)	30 or less (non condensing)
Altitude, operating (m)	1600 or less

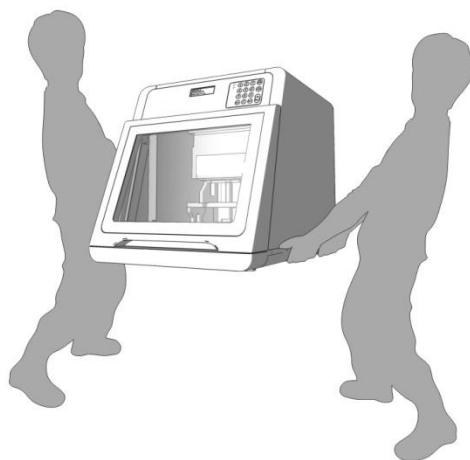
## 1.4 Unpack the AnaPrep 12 system

- (1) Open the packing box and take out the instrument and related accessories.

### Important:

The AnaPrep 12 system weighs more than 43 kg (approx. 95 lbs). It should be lifted and moved by at least two individuals.

Hold the moving handles of the instrument from two sides to lift it out from the box.



- Do not hold the plastic outer covering.
- Do not hold the front panel.
- Do not hold the door.



### Caution:

Improper handling or movement of the AnaPrep 12 system will

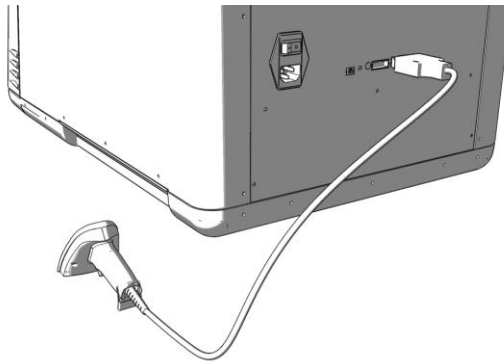
lead to instrument damages.

For correct and safe use of AnaPrep 12, install it in a location that is close to an electrical outlet and has enough space for installation and operation of the main switches.

**Important:**

Keep the shipping box and packaging materials. They will be needed again when transporting the AnaPrep 12 system.

(2) Connect Barcode Reader with the Instrument.



- (3) Remove the polystyrene foam block inside the instrument following the steps below:
- i. Plug in the power cord to the instrument and connect to the electrical outlet.
  - ii. Turn on the power switch.
  - iii. Press the “START” button on the Control Pad. After the piston module moves up, remove the polystyrene foam block.



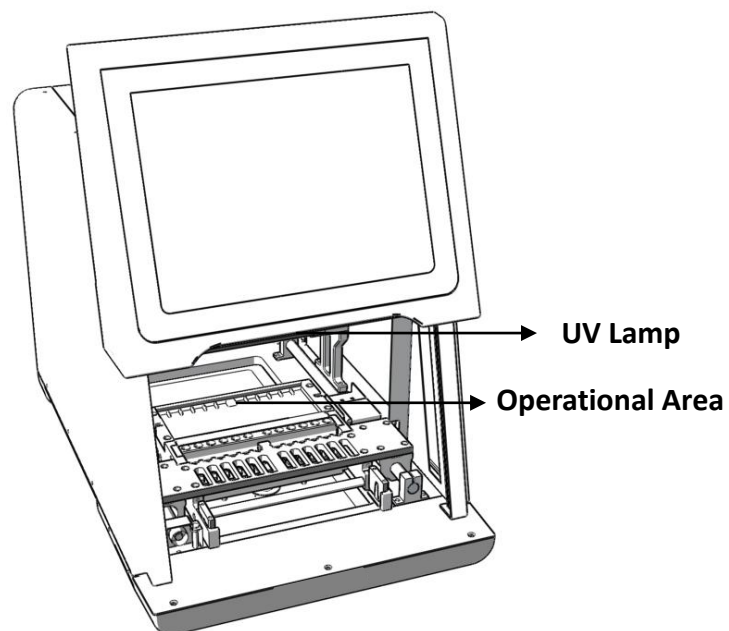


## 1.5 Overall View

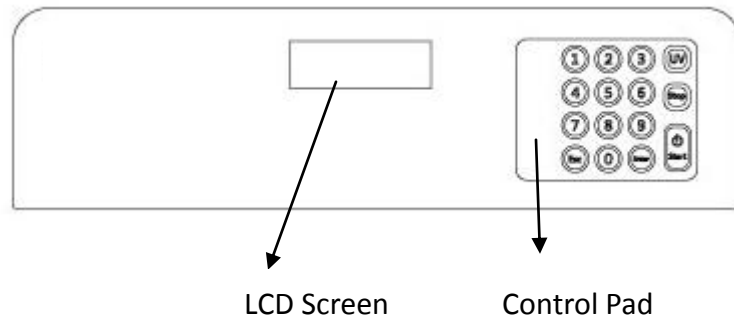
### ■ Front view with Sliding Door closed



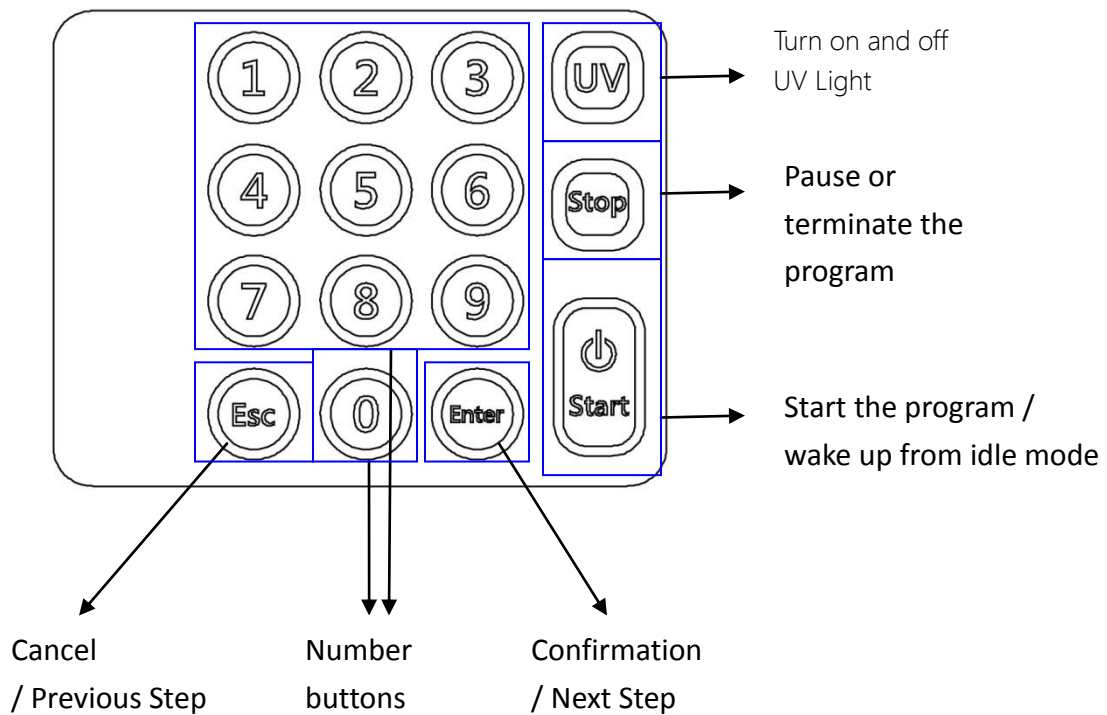
### ■ Front view with Sliding Door opened



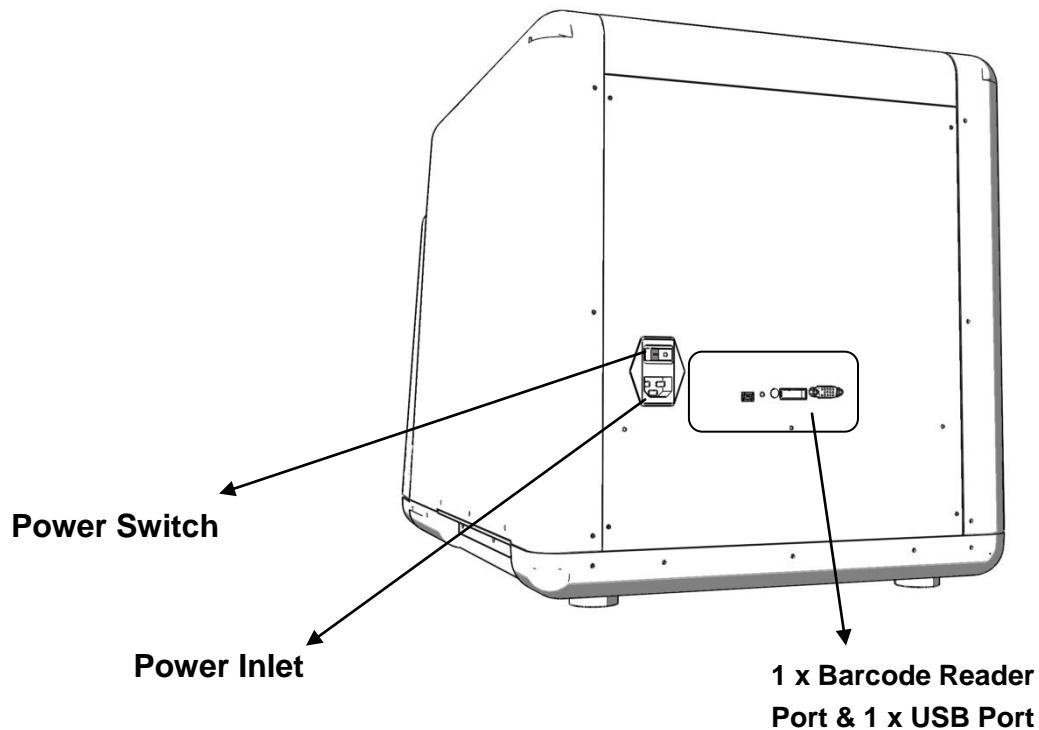
## ■ LCD Panel and Control Pad



- The LCD screen displays information of operation, instruction guide, and program process status.
- The Control Pad is used for selection of functions and input of program and test codes.



## Back View



## 2 Getting Started



### **Biohazard:**

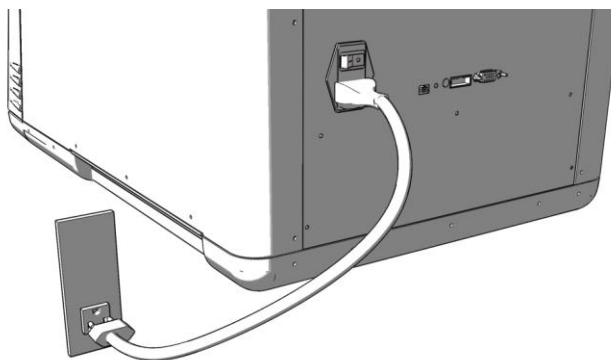
Always wear appropriate gloves, mask, and safety goggles during any biohazardous operations. Human samples may be processed in the instrument which increases the possible risk of infection. Always follow standard safety procedures and wear the appropriate gloves, mask and safety goggles when handling specimens and reagents.

### **Important:**

Before starting extraction, put on appropriate gloves, mask, and safety goggles. When preparing samples for extraction, be careful not to contaminate the samples with sweat, saliva, etc.

## 2.1 Turning on the power

- (1) Make sure that the power cable is connected securely to the AnaPrep 12 system.
- (2) Connect the plug of the power cable to the outlet.



## 2.2 Preparation

The following preparations are required for the extraction operation.

- Items to be prepared:
  - Gloves
  - Mask
  - Safety Goggles
  - Reagent Cartridge(s)\*
  - Reaction Chamber(s)\*
  - Tip Holder\*

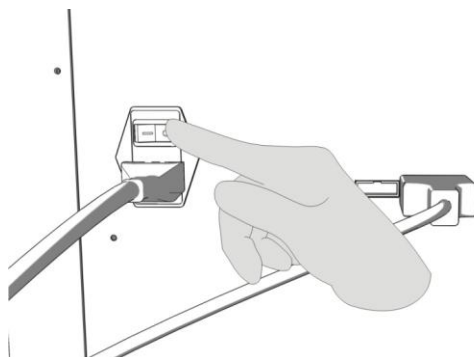
- Filtered tip\*
- Sample tube\*
- Elute tube\*
- Piercing Pin\*

■ For the preparation of samples, refer to the handbook of each kit.

\*: Provided with the Reagent Kits.

## 2.3 Extraction

- (1) Turn on the power switch then wait for the LCD screen to turn on and display “AnaPrep 12 System Stand-By”.



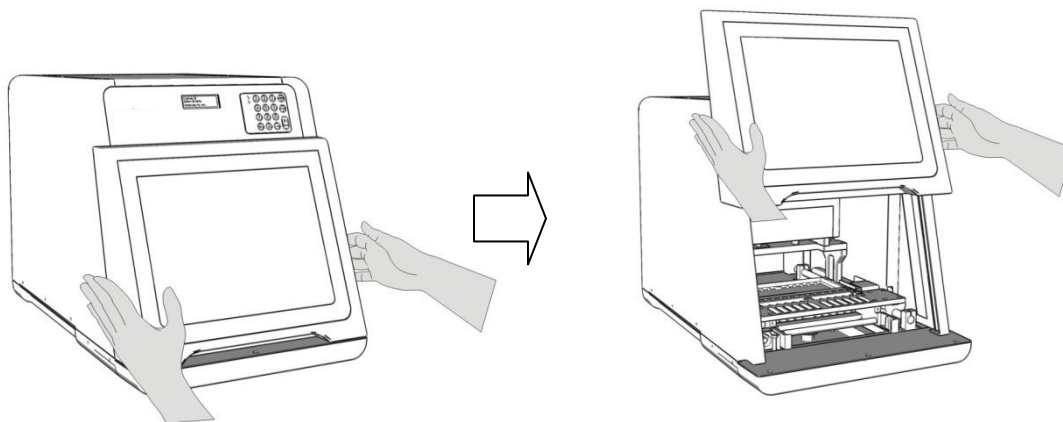
- (2) Press the “Start” button

(The system will initiate a self-testing process, “initializing”, before entering steady mode)

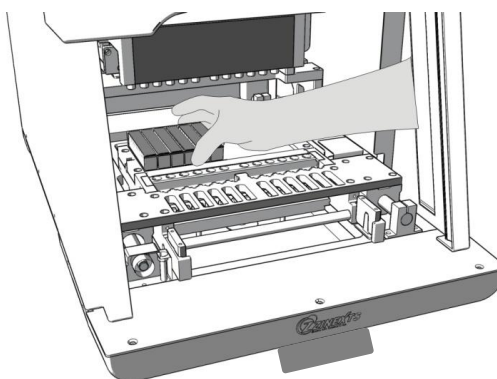
### **Note:**

The system will not respond to any information entered from the key pad until the completion of the self-testing process.

- (3) Open the sliding door and remove the sample rack from the instrument.



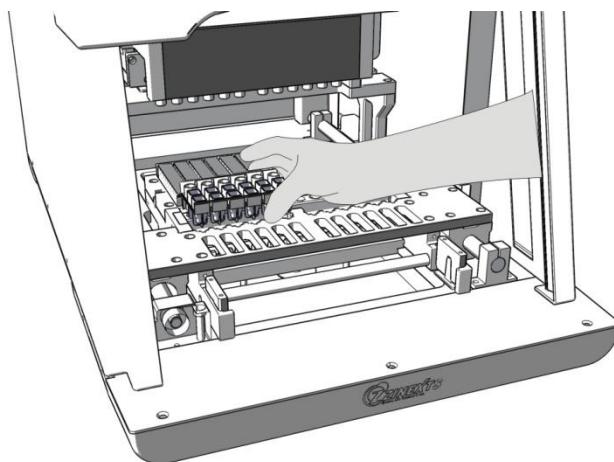
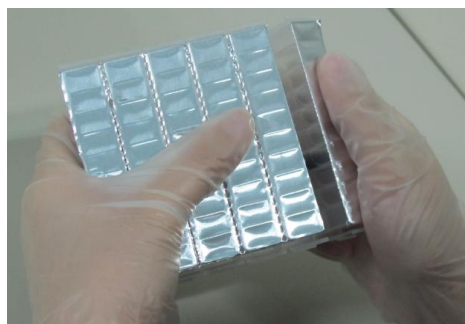
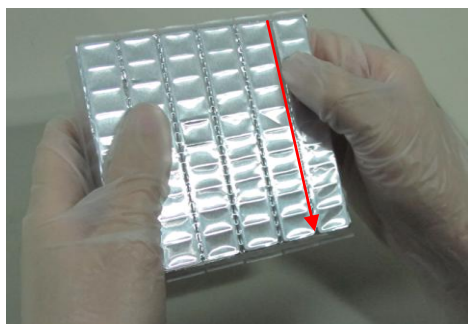
- (4) Load Reagent Cartridges, and all plastic disposables (Reaction Chamber, Tip Holder, Piercing Pin, and Filtered Tip).



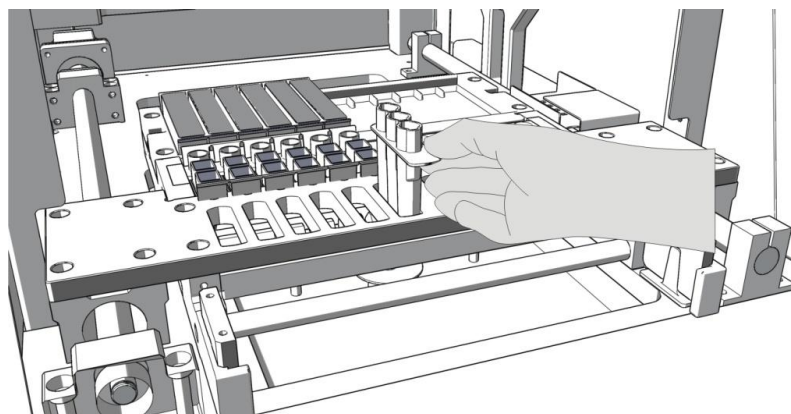
**Insert the cartridges**

### ■ How to pull apart reagent cartridges

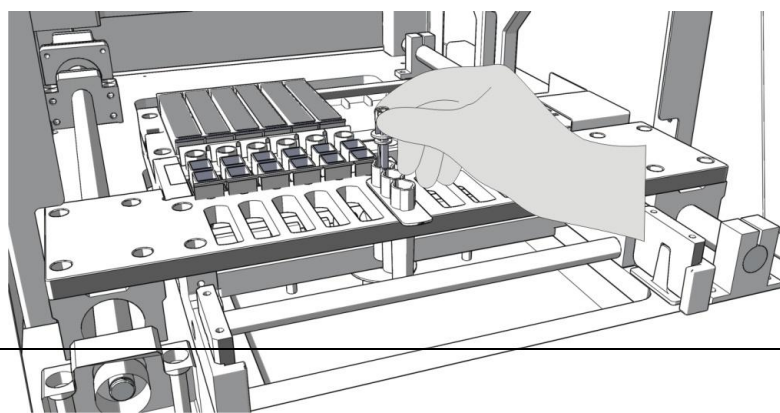
- Cut the foil at the dotted line with a finger nail, then snap the cartridge apart.



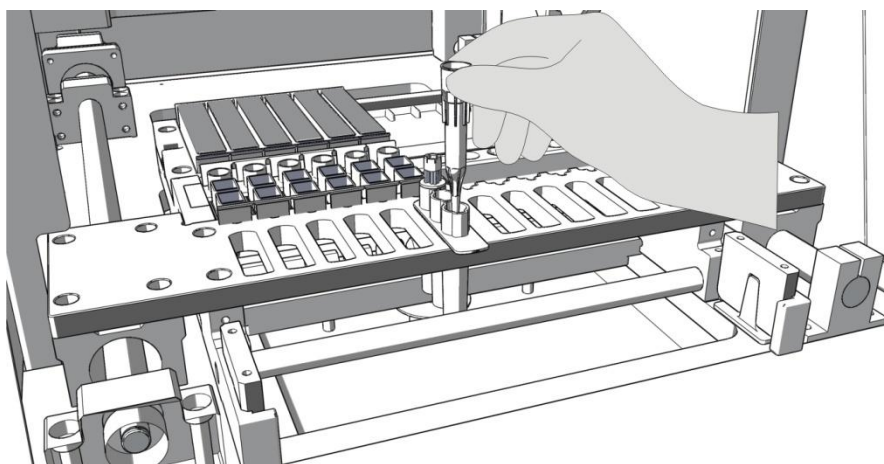
**Insert Reaction Chambers**



**Insert Tip Holder**



### Insert Piercing Pins (showing only one row)



### Insert Filtered Tips (showing only one row)

#### Note:

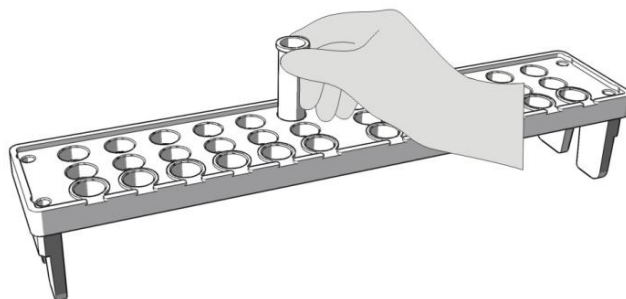
Load one Reagent Cartridge and one set of plastic disposable per sample. Please note the positions of the piercing pin and filtered tip; the second row should be **EMPTY**.

#### Important:

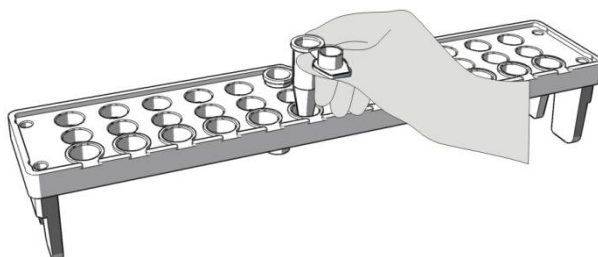
- Insert cartridges, disposables, and samples from left to right to ensure that they are aligned within the instrument.
- Make sure that the cartridges are inserted into the Cartridge Tray tightly.
- You can load 1-12 cartridges on the tray depending on the number of samples that you wish to process.



(5) Load Sample Tube and Elute Tube to Sample Rack on the bench

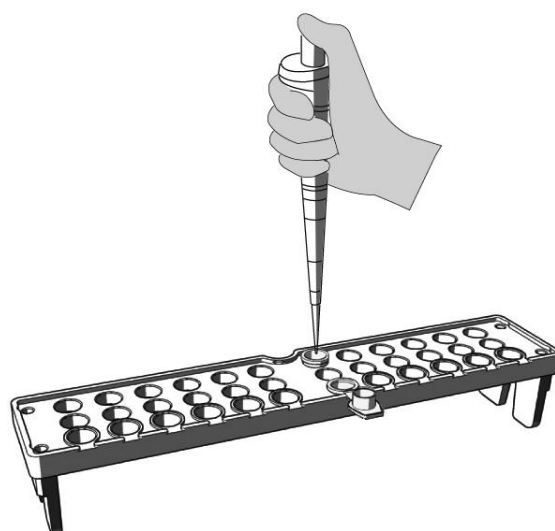


**Insert Sample Tube on to Sample Rack**



**Insert Elute Tube on to Sample Rack**

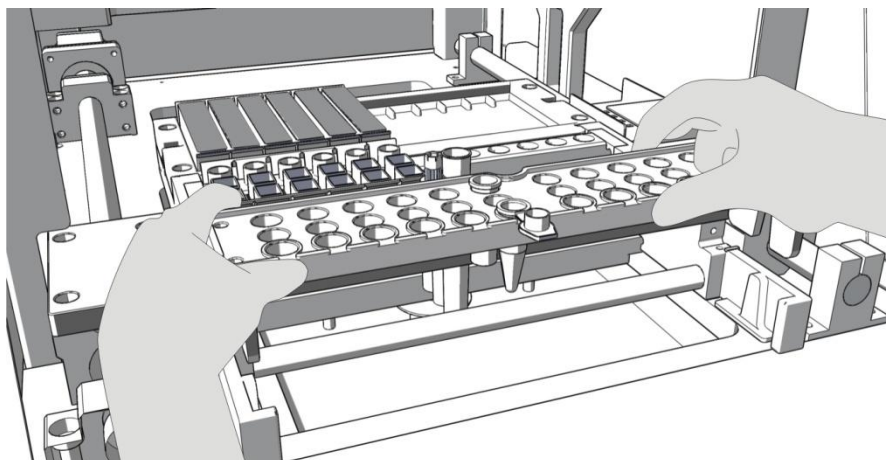
(6) Load the sample(s) to Sample Tube



**Note:**

- Pretreatments are essential for some sample types before loading to Sample Tube. Please refer to the handbook of reagent kits for details.
- Make sure the caps of Elute Tube are open as shown in the figure above.

(7) Place Sample Rack on the instrument platform

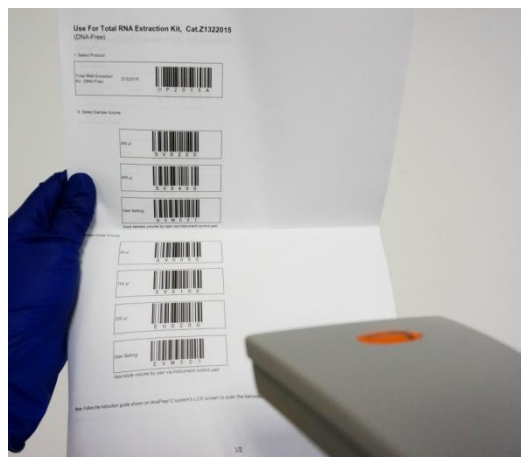


**Note:**

- Use two hands to handle the Sample Tray.
- Make sure the Sample Tray is placed correctly in the instrument

(8) Close the Sliding Door and press the Start button

(9) Scan the protocol barcodes to select purification protocol, sample volume and elute volume



**Note:**

- Each reagent kit box is supplied with a kit-specific protocol barcode sheet.
- Protocol's name, sample volume and elution volume will be shown on LCD screen after the protocol barcode is scanned.

- (10) Follow the instructions displayed on the LCD screen to double check the operating steps before running the program.
- (11) Press “Enter” to confirm. The instrument will start to run the selected protocol program automatically until the whole process is completed.

**Note:**

- It takes from 30 to 45 minutes to complete the extraction process depending on the reagent types.

- (12) At the end of the run, the instrument beeps briefly and the LCD shows “Protocol Completed”.
- (13) Open the instrument door.
- (14) Remove the elute tubes containing the purified nucleic acid.

**Note:** Store the purified nucleic acids at 4°C for short-term storage or store at -70°C for long-term storage.

(15) Discard the used cartridges and all plastic consumables into the biohazard waste bin. Do not re-use the cartridges.

(16) If you're not using the instrument, place the Sample Rack back in the instrument, close the sliding door and push the "Start" button for 2 seconds to enter into "sleep mode".

If not using the instrument for a longer period of time, turn off the power switch.

## **2.4 After Extraction Operation**

(1) Take out the Elute Tubes (the extracted nucleic acids are stored in them).

**Note:**

i. The samples are ready for downstream applications.

(2) Remove the cartridges and plastic disposables from the instrument for disposal.

## **3 Cleaning & Maintaining the AnaPrep 12 system**

Two types of maintenance are performed on the the AnaPrep 12 Instrument as listed in the table. For details on each type of maintenance, see below:

Maintenance Type	Performed by	Schedule
Routine		
(17) Cleaning of Sample Tray	User	After each use
(18) Cleaning of instrument body (outside)	User	Bi-weekly
(19) Cleaning of instrument body (inside)	User	Bi-weekly
Preventive	Service Engineer	Annually

- Clean the Sample Tray with mild detergent and rinse with deionized water. Allow the parts to dry before use. Clean and disinfect the platform surface by wiping with deionized water followed by 70% ethanol.
- Clean the instrument body by dusting gently with a dry, soft cloth. If the outside of the AnaPrep 12 system is heavily soiled or stained with samples wipe with 0.5% sodium hypochlorite solution or 70% ethanol.

## 4 Troubleshooting

Problem	Cause	Solution
<b>Instrument Problems</b>		
No power (the LCD Screen remains blank when the power is turned on)	AC power cord is not connected	Check AC power cord connections at both ends. Or Use the correct cords.
LCD Screen turns on when the power is on but the self-testing program does not run	Forgetting to remove the packaging material from the instrument	Turn off the instrument and remove the packaging material.
	Technical problem	Contact your local representative or agent
Protocol stops after an initial start	Cartridge(s), Plastic ware (Reaction Chamber, Tip	Turn off the power and then turn it on again to stop the program. The system will move back to the initial state.

	Holder, Filtered Tip, Sample Tube, Elute Tube) loaded incorrectly	Re-load the cartridges or plastic wares according to the instructions shown in this manual.  Note: The protocol will NOT resume after stopping and you may lose your samples.
	Problem with motion sensors	Turn off the power and remove all samples and plastic ware. Contact your local representatives
Bubbles formed during extraction	Missed adding sample or sample volume is lower than the recommended volume	Be sure to add the sample to the tubes prior to starting the protocol. To prevent bubble formation during mixing, make sure the sample volume is at or greater than the recommended minimum volume listed in Reagent Kit manuals.
Presence of buffer in the Cartridge Tray	Motor movements may not be smooth, incorrect placement of plastic ware, or leakage from tips	Perform preventive maintenance annually to ensure proper motor movements.
Leakage from Filtered Tips or uneven liquid handling between Filtered Tips	Air leakage on the Filtered Tip	Swap the air-leaked Tip with new one
<b>Blockage of tips and pipetting failure</b>	<b>Too much starting material or excess DNA in sample causing clumps or aggregates</b>	<ol style="list-style-type: none"> <li><b>1. Decrease the amount of starting material. Use the recommended amount of starting material as listed in the Reagent Kit manual (Handbook).</b></li> <li><b>2. Suggest using blood kit 1200 instead of blood kit 200 (if testing sample is blood)</b></li> </ol>

DNA Quality Problems		
Problem	Cause	Solution
Low DNA yield	Incomplete lysis	Decrease the amount of starting material used.
		Be sure to add Proteinase K during lysis, if included in the protocol.
		Make sure that the sample is completely immersed in the Lysis Buffer.
	Poor quality of starting	Be sure to process sample immediately after collection or store

	material	the sample at appropriate temperature. The yield and the quality of DNA isolated depend on the starting material.
	Insufficient amount of magnetic beads added	During shipping, some magnetic bead solution may adhere to the sealing foil of the cartridge. To collect any bead solution from the foil, tap the cartridge to deposit the bead solution at the bottom of the well.
	Clogged Tips resulting in DNA loss	Ensure that the lysate does not contain particulates that could clog the end of the pipette tips. If needed, centrifuge the sample prior to placing it in the AnaPrep instrument.
No DNA recovered	Magnetic beads stored or handled improperly	Store cartridge containing the beads at room temperature.
		Do not freeze the cartridge as the beads may be damaged.
		Make sure that the beads are in the solution at all times and do not dry out.
Elute containing DNA is discolored	Magnetic beads present in the eluate	Remove any magnetic beads using a magnetic separator or centrifuge the sample in a microcentrifuge for 1 minute at maximum speed.
	DNA contaminated with heme	Minimize the amount of blood or blood-stained sample used ( $\leq 20 \mu\text{l}$ blood spot for forensics sample).
DNA is sheared or degraded	Bubbles formed during mixing steps	To prevent bubble formation during mixing, make sure the sample volume is at least the recommended volume listed in the manual supplied with Reagent Kits.
	Purified DNA repeatedly frozen and thawed	Aliquot purified DNA and store at $4^{\circ}\text{C}$ (short-term) or $-20^{\circ}\text{C}$ (long-term). Avoid repeated freezing and thawing.
	DNA contaminated with DNases	Maintain a sterile environment while working (i.e. wear gloves and use DNase-free reagents).

## Specifications

<b>Model</b>	AnaPrep 12
<b>Instrument Type:</b>	Benchtop automated nucleic acid extractor
<b>Sample Processing:</b>	1 to 12 samples per batch
<b>Sample Volume Handling:</b>	100 – 1200 $\mu\text{l}$
<b>Processing Time:</b>	See purification kit manual for details

<b>Heat Block Temperature:</b>	60°C to 70°C (assuming the room temperature is ~25°C)
<b>Protocol Input:</b>	Barcode Reader
<b>Built-in Features:</b>	LCD Display Screen
<b>Instrument Dimensions:</b>	47 cm W x 68 cm D x 51 cm H (18.5 in x 26.8 in x 20.1 in)
<b>Weight:</b>	43 kg (94.8 lbs)
<b>Input Power:</b>	AC 100-240 V, 240 VA, 50/60 Hz
<b>Operating Temperature:</b>	10-40°C
<b>Operating Humidity:</b>	30-80%
<b>Fuse:</b>	F3A 250V
<b>Temperatures allowed during transportation/ storage/ packaging:</b>	-25°C to +70°C

## CE

LV directive (73/23/EEC)

EMC directive (89/336/EEC)

## EMC

EN61326-1

## Safety

EN60101-1, EN60101-2



## APPENDIX

### (20) Replacement/Optional Parts

Item	Quantity	Part No.
Barcode Reader	1	Z1323012
Power Cord	1	Z1323011
Sample Rack	1	Z1323014
Filtered Tip	38	Z1323003
Piercing Pin	38	Z1323004
Sample Tube	38	Z1323006
Elute Tube	38	Z1323007

### (21) Product Guarantees

- i. The guarantee period shall be one year from the delivery of the product.
- ii. Any part which fails to function properly under normal use provided that all warnings and cautions in this manual are observed will be repaired by the **BioChain Institute Inc.** during the guarantee period, free of charge.
- iii. If the problem is due to the causes listed below, some charges may be applied for the repair even within the guarantee period.
  - Any failures due to improper use or that are affected by other devices except for those approved by the BioChain Institute Inc.
  - Any malfunctions or damages during transportation or due to

dropping of the product by a user.

## **(22) About Services**

Before requesting for device repairs, refer to section “4 Troubleshooting” to check the problems. If the problems cannot be solved, contact your local representative, or the relevant customer support.

## **(23) Notes for Moving the AnaPrep 12 system**

When moving the AnaPrep 12 system to a new location, perform the following tasks:

### **Warning:**

- Before carrying the AnaPrep 12 system, disconnect the plug from the outlet. If the power cable is damaged, this may cause a device failure, fire, injury, or electric shock.

Remove all attached parts (Sample Rack, Barcode Reader) from the AnaPrep 12 system.

### **Important Note on Shipping AnaPrep 12:**

If the AnaPrep 12 will need to be shipped, please contact

BioChain for detailed instructions.

## **BioChain Institute Inc**



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